

natural food substance, is only another way of indiscriminate administration of vitamins—for which the present writer sees no need for euphemism.

At best, the industrial physician should not expect miracles of production from vitamin feeding. In an earlier paragraph, I have indicated the obstacles sometimes imposed by management and other factors. Experiment in determining the effects of such supplements can be made only under difficulties, and the results must be interpreted with caution. I have reported one such experiment³ that unavoidably leaves much to be desired for complete scientific control. The results of six weeks of administration showed a moderate increase in production, a moderate decrease in absenteeism, and a marked decrease in spoilage. About half of the employees reported subjective improvement. In other plants where the nutrition level was higher or lower, the differences might be correspondingly smaller or greater. And in one where the morale of the employees and the policies of management were unsatisfactory, there might be no effect whatever except the subjective.

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CONTROL OF TOXIC EXPOSURES*

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BASICALLY, the prevention of occupational diseases is a problem of air hygiene. Of the three portals of entry of toxic substances,—namely, skin, digestive tract and respiratory tract,—the last is the one of major significance. It is true that the industrial dermatoses bulk largest in the occupational disease picture, and that some few substances may be absorbed through the skin to cause systemic poisoning. Further, in large-enough doses, some materials are absorbed in dangerous concentration from the digestive tract. But those toxic materials entering the respiratory tract in the form of dust, fume, mist, vapor or gas, are absorbed into the circulation in a disconcertingly efficient manner.

* One of several papers in a Symposium on "Industrial Medicine in Wartime—the Widening Field of Industrial Medicine." Papers collected by Rutherford T. Johnstone, M. D.

Let us say that a concentration of 500 parts of carbon tetrachloride per million parts of air (maximum allowable concentration—100 PPM) is discovered by appropriate sampling methods in a given work-room atmosphere.

It then becomes necessary for a team of physicians, engineers and chemists to reduce the concentration to a safe level or to substitute a harmless chemical.

As in the treatment of patients, so in the management of a plant, the remedy must be suited to the individual problem. The method employed must be consistent with the production pattern, available materials, and a number of other considerations. However, there are basic principles which are applicable in all cases.

PRINCIPLES INVOLVED

The principles are as follows, in the order of their importance and practical application:

1. *Substitution* of a nontoxic or less toxic substance for the toxic one; e.g., the use of Stoddard's solvent rather than benzol in certain steps of rubber fabrication. This control measure is fool-proof. But production demands frequently preclude the application of this principle, and therefore we must resort to

2. *Isolation* of the process. This may be accomplished in one of three ways:

a. Geographically: by removing the process, from a shop where many workers are exposed to an isolated place on the grounds where few or no workers are exposed.

b. Chronologically: as in the case of some foundries, where it is the practice to have the small "shake-out" crews come in after the majority of the workers doing pouring and molding are gone for the day.

c. Enclosure: by actually building an enclosed space around the dangerous process and preventing the escape of noxious material into the workroom air.

Here again production demands may be such that they do not permit of such practices, and we must rely on

3. *Dilution or General Ventilation*. In other words, if 600 PPM of trichlorethylene are present in the worker's breathing atmosphere, and enough air can be brought in and thoroughly mixed at the breathing zone to dilute the concentration to a point below 200 PPM, the desired objective is accomplished. If it works, this is one of the best control procedures; but there are so many variables in the picture that it is usually more practical to install

4. *Local Exhaust Ventilation*. This is truly a subject in itself, and expert guidance must be sought to apply it in a practical and efficient manner. It is well known that exhaust orifices have no "reaching out" effect to entrap the material in question. The fact is, that only one duct diameter away from the orifice the velocity drops to 7

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TABLE 1.—Reference Chart Concerning Basic Exposures

RESPIRATOR	HAZARD					DRAWBACKS
	DUST	FUMES	MISTS	VAPORS	GASES	
Dust (Filter)	*		*			Offer resistance to breathing.
Fume (Filter)		*				Offer resistance to breathing.
Chemical cartridge (Activated charcoal, etc.)				X	X	Low capacity. Rely on sense of smell as index to change cartridge.
Supplied air respirator (Face or helmet)	X	X	X	*	*	Cannot move around freely because of hose.
Gas mask with canister				X	X	Cumbersome. Use only in emergencies.
Oxygen breathing apparatus	X	X	X	X	X	Only for emergencies in which gas mask is inadequate.

* Most desirable. X Desirable.

NOTE:—Use only the makes of respirators which are approved by the U. S. Bureau of Mines.

CONCLUSIONS

1. The primary consideration of shock should never be overlooked. It is vitally important to adopt and learn a simple method for determining the amount of plasma, versus cells, and administer plasma accordingly. The Harkins method is recommended.

2. The preparation of the burned patient is an aseptic surgical procedure.

3. Pickrell's solution of sulfadiazine spray is the procedure of choice, with daily normal saline hydrotherapy as an adjunct.

Pressure bandages and transparent jacket system are discussed.

3000 Ocean Park Boulevard.

CONTROL OF TOXIC EXPOSURES*

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per cent of the velocity within the duct. Therefore, it is essential that any exhaust system must be applied at the point of origin of the material over which control is desired; i.e., it must be truly *local* exhaust ventilation.

(Special Note: the above-mentioned are *general* control principles, and it must be stated that there are certain measures which may be employed in special instances, such as wetting to minimize a dust problem.)

When all of these methods of control must be ruled out because of some production snag or lack of materials, or because the expense is not justified, e.g., short-time exposure to relatively low concentrations, the last resort is . . .

5. *Personal Protective Equipment.* There are many types of personal protective equipment for protection against mechanical injury as well as occupational diseases. Inasmuch as occupational diseases most frequently arise from the inhalation of toxic agents, said *personal* protective equipment is usually in the form of some type of respirator. In general, respirators are uncomfortable to wear, and their sanitation is not always what it should be. Consequently, the workers will frequently not wear the respirators. Hence, control of the environmental air is much more effective than the uncertain use of individual respirators.

However, there are times when the only alternative is the use of respirators. Each type of respirator is designed for a specific hazard. Not infrequently, however, we have noticed that a simple *dust* respirator is employed for the desired purpose of controlling an *organic vapor hazard*. Table 1 is a ready-reference chart listing the basic exposures with appropriate respirators indicated, as well as the limitations thereof.

808 North Spring Street.

Diphtheria in California

(COPY)

CALIFORNIA STATE DEPARTMENT OF PUBLIC HEALTH
BUREAU OF EPIDEMIOLOGY

Diphtheria Cases Reported by Months for Year 1944

January	127
February	118
March	119
April	94
May	103
June	90
July	59
August	83
September	67
October	93
November (reports received through Dec. 5)...	148
Total	1101

* Conclusion of article by Hugh Dierker, M.D. and Paul G. Brown.

(COPY)

California State Department of Public Health
Notice to Health Officers

December 4, 1944.

Attached is a copy of a letter sent to all physicians in Berkeley and Oakland by their respective health officers, calling attention to the presence of the *Gravis* type of diphtheria.

This type of diphtheria calls for prompt administration of antitoxin in maximum dosage. Because speed is essential in treating this type of diphtheria it is recommended that physicians treat all suspected cases of diphtheria with antitoxin at once without waiting for laboratory confirmation.

Your attention is called to the fact that the *Gravis* type cultures may not develop characteristic morphology with 24 hour incubation, but that it may be necessary to incubate cultures for 48 hours or longer before the organisms may be identified.

In serious cases of diphtheria from which only negative cultures are obtained it is recommended that subcultures be sent to the State Laboratory for further study.

Bureau of Epidemiology, 1122 Phelan Bldg.,
San Francisco, 2.

CITY OF OAKLAND

Department of Public Health

CITY OF BERKELEY

Department of Public Health

Dear Doctor:

During the past three weeks we have had in the East Bay Area a sudden increase in diphtheria. To date we have had 13 cases and 3 deaths.

The fact that makes this especially important is that the B, diphtheria is of the *Gravis* type. This is the most toxic type, originally reported in England, and reported throughout the United States increasingly during the past ten years.

Myocardial damage is extremely common in this type of infection, death taking place from seven to ten days after the onset of the disease and following clearing of the throat infection.

Throat cultures from suspected cases cannot be considered negative unless no organisms are seen following 48 hours incubation.

Immediate treatment is recommended on all suspicious cases (sore throat with suggestive membrane and low temperatures) regardless of culture findings.

Diphtheria antitoxin given—10,000 units intra venously and 30,000 units intra muscularly as soon as a provisional diagnosis is made, is recommended.

Additional antitoxin may be advisable during the first 24 hours if the case shows any degree of toxicity.

Prolonged bed rest in all cases is advisable.

Booster doses of toxoid are recommended for all children whose primary immunization was 2 years or more ago.

Sincerely,

(Signed) S. F. FARNSWORTH,
S. F. Farnsworth, M.D.,
Health Officer, Oakland.

(Signed) FRANK L. KELLY,
Frank L. Kelly, M.D.,
Health Officer, Berkeley.

Basil Valentine, possibly the pseudonym of Johann Thölde, an alchemist of Franckenhausen, was the author of "The Triumphant Chariot of Antimony," printed in 1604, in which a mixture of mercury, lead and antimony is recommended in the treatment of syphilis.